Detergent composition.

Publication number: EP0036720
Publication date: 1981-09-30
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Classification:
- international: ***C11D3/50;*** **C11D3/50;** (IPC1-7): C11D3/50; C11D1/835; D06M13/46
- European: C11D3/50B2
Application number: EP19810300974 19810309
Priority number(s): GB19800008239 19800311

Also published as:
US4636330 (A1)
JP56143299 (A)
ES8205555 (A)
EP0036720 (B1)
PT72639 (B)
more >>

Cited documents:
DE2805767

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Abstract not available for EP0036720

(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 036 720**
B1

(12) # EUROPEAN PATENT SPECIFICATION

(45) Date of publication of the patent specification: **17.08.83**

(51) Int. Cl.³: **C 11 D 3/50**, C 11 D 1/835, D 06 M 13/46

(21) Application number: **81300974.3**

(22) Date of filing: **09.03.81**

(54) **Detergent composition.**

(30) Priority: **11.03.80 GB 8008239**

(43) Date of publication of application: **30.09.81 Bulletin 81/39**

(45) Publication of the grant of the patent: **17.08.83 Bulletin 83/33**

(84) Designated Contracting States: **AT BE CH DE FR GB IT LI NL SE**

(56) References cited:
EP-A-0 011 499
DE-A-2 805 767
GB-A-1 544 863
US-A-4 151 097

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(84) Designated Contracting States: **BE CH DE FR IT LI NL SE AT**

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Detergent composition

Technical field

This invention relates to a method of depositing perfumes on surfaces, in particular to compositions for carrying out such a method. The surfaces which can be treated by the method of the invention include fabrics such as cotton, wool, polyacrylic, polyester and polyamide fibres and hard surfaces such as ceramic, plastics material laminate, metal, wood and glass. The methods are applicable to the treatment of such surfaces both by hand and by machine, such as the machine washing of fabrics.

Background art

It is known to include perfumes in detergent compositions to provide a pleasant after-smell on the treated surfaces. It is desirable to have the perfume component of a detergent composition used efficiently because it is a relatively high cost component. In use, the perfume will be often present in the treatment liquid at a relatively low concentration.

It has been proposed in GB-A-1 544 863 to incorporate perfume on a fabric conditioning prill containing nonionic and optionally cationic materials, up to a maximum cationic to nonionic ratio of 5 : 1, the prills having a size of 5 to 2000 μm. These prills are picked up by the fabrics during washing and thereafter are melted in a laundry dryer to release the perfume.

Disclosure of the invention

We have now surprisingly discovered that a perfume benefit can be obtained by incorporating a perfume in particles consisting essentially or predominantly only of cationic particles and that such particles are compatible with detergent active materials usually employed for cleaning surfaces, thereby enabling the cleaning of surfaces and the deposition of perfumes thereon to be carried out in a single step.

According to the invention there is provided a detergent composition for cleaning and depositing perfume on a surface, comprising

from 5% to 85% by weight of a water-soluble detersive surfactant, with or without a detergency builder; and
from 0.5% to 30% by weight of particles having an average size of from 0.1 to 2000 μm and being an intimate mixture of a matrix material and from 0.5% to 50% by weight of a perfume component, based on the weight of the particles,

characterised in that the matrix material comprises, based on the weight of the particles:

from 22% to 99.5% by weight of a cationic component; and optionally
from 0% to 16.6% by weight of a nonionic component, the ratio by weight of the cationic component to the nonionic component, when present, being at least 5 : 1.

The perfume carrying particles preferably have a size of from about 20 to about 500 μm, most preferably from about 50 to about 200 μm. A mixture of different particle sizes may be used. In particular it may be advantageous to use a mixture of relative by smaller particles with relatively larger particles with few, if any, particles of intermediate size.

The amount of perfume in the particles should be between 0.5% to 50% by weight based on the weight of the particles, preferably between about 10% and about 30%.

The perfume may be selected from any perfumes and any mixtures thereof. Examples of fabric substantive perfumes suitable for use in the present invention are listed in S Arctander, Perfume Flavors and Chemicals, Volumes I and II, published by the Author, Montclair, New Jersey, USA, and the Merck Index, 8th Edition, Merck & Co Inc, Rahway, New Jersey, USA. Deodorant perfumes such as disclosed in US-A-4 134 838 may also be used.

Suitable cationic materials useful in the particles may be water soluble or insoluble and include any of the cationic (including imidazolinium) compounds listed in Morton; US-A-3 686 025. Such materials are well known in the art and include, for example, the quaternary ammonium salts having at least one, preferably two, $C_{10}-C_{20}$ fatty alkyl substituent groups, alkyl imidazolinium salts wherein at least one alkyl group contains a C_8-C_{25} carbon »chain«; and the $C_{12}-C_{20}$ alkyl pyridinium salts.

Preferred cationic materials herein include the quaternary ammonium salts of the general formula $R^1R^2R^3R^4N^+X^-$, wherein troups R^1, R^2, R^3 and R^4 are, for example, alkyl, and X^- is an anion, eg halide, or methylsulfate, with the chloride and methylsulfate salts being pereferred. Especially preferred

cationic components are those wherein R^1 and R^2 are each substituted or unsubstituted straight or branched chain alkyl or alkenyl groups having 12 to 20 carbon atoms, R^3 and R^4 are each substituted or unsubstituted alkyl groups having 1 to 4 carbon atoms, and X^- is a univalent anion. The fatty alkyl groups can be mixed, ie, the mixed $C_{14}C_{18}$ coconutalkyl and mixed $C_{16}-C_{18}$ tallowalkyl quaternary compounds. Alkyl groups R^3 and R^4 are preferably methyl.

Exemplary quaternary cationic materials herein include ditallowalkyldimethylammonium methylsulfate, ditallowalkyldimethylammonium chloride, dicoconutalkyl-dimethylammonium methylsulfate, and dicoconutalkyldimethylammonium chloride.

When the particles contain a nonionic component, this may be a compound or a mixture of compounds selected from esters of polyhydric alcohols, fatty alcohols, and derivatives thereof. Suitable examples include sorbitan tristearate, ethoxylated alcohols and the condensation products of propylene glycol with ethylene oxide. Preferably, the weight ratio of the cationic component to the nonionoic component lies between about 6 : 1 and about 12 : 1.

Alternatively the particles may contain substantially no nonionic material.

In addition to the cationic material, the perfume and, when present, the nonionic material, the particles may also contain an amine, in particular a water-dispersible amine having the general formula

$$R-N-R_1R_2$$

where R is an alkyl or alkenyl group having 2 to 22 carbon atoms, R_1 is hydrogen or an alkyl or alkenyl group having 1 to 4 carbon atoms, and R_2 is hydrogen or an alkyl or alkenyl or amino-alkyl group having 1 to 22 carbon atoms. When an amine is present in the particles, it is preferably present in a minor amount.

Particular examples of such amines are hardened tallow primary amine, cocoprimary amine, methyl dihardened tallow tertiary amine, eicosanyl-dicocosanyl primary amine and N-alkyl 1 : 3 propylene diamines, where the alkyl group is hardened tallow, coco or a $C_{18}-C_{20}$ mixture.

The particles are incorporated in a detergent composition which may be in solid or liquid form. The composition will contain a detergent active material, with or without a builder, the particles and optionally such other materials as are conventionally included in detergent compositions.

The detergent composition will contain from 5% to 85% by weight of a detergent active material optionally together with a detergency builder and from 0.5% to 30% by weight of the particles.

Preferably the quantity of particles in such a composition is between 0.7% and about 7%.

The detergent active material is preferably selected from anionic, nonionic, zwitterionic and amphoteric detergent active materials and mixtures thereof. Suitable surfactants and builders include those listed in »Surface Active Agents and Detergents«, Volumes I and II, by Schwartz, Perry & Berch. Preferred detergent active materials include synthetic detergent active materials.

Typical synthetic anionic detergents are the alkyl benzene sulphonates having from 8—16 carbon atoms in the alkyl group, eg sodium dodecyl benzene sulphoate; the aliphatic sulphonates, eg C_8-C_{18} alkane sulphates; the olefin sulphonates having from 10—20 carbon atoms, obtained by reacting an alpha-olefin with gaseous diluted sulphur trioxide and hydrolysing the resulting product; the alkyl sulphates such as tallow alcohol sulphate; and further the sulphation products of ethoxylates and/or propoxylated fatty alcohols, alkyl phenols with 8—15 carbon atoms in the alkyl group, and fatty acid amines, having 1—8 moles of ethoxylene or propoxylene groups.

Typical nonionic detergents are the condensation productions of alkyl phenols having 5—15 carbon atoms in the alkyl group with ethylene oxide, eg the reaction product of nonyl phenol with 6—30 ethylene oxide units; the condensation products of higher fatty alcohols, such as tridecyl alcohol and secondary $C_{10}-C_{15}$ alcohols, with ethylene oxide, known under the trade name of »Tergitols« (Registered Trade Mark) supplied by Union Carbide, the condensation products of fatty acid amides with 8—15 ethylene oxide units and the condensation products of polypropylene glycol with ethylene oxide.

Also within the scope of this invention are those products which contain soap as a part of the detergent active material or as the sole detergent active material. Suitable soaps include the alkalimetal salt of fatty acids containing between 10 and 24 carbon atoms. Particular examples are the sodium salts of tallow, coconut, palm oil or rapeseed oil fatty acids.

Suitable builders are weakly acid, neutral or alkaline reacting, inorganic or organic compounds, especially inorganic or organic complex-forming substances, eg the bicarbonates, carbonates, borates or silicates of the alkalimetals; the alkalimetal ortho-, meta-, pyro- and tripolyphosphates. Another class of suitable builders are the insoluble sodium aluminosilicates as described in BE-A-814 874.

The compositions according to the invention may also include other ingredients conventionally added to detergent compositions, including bleaches, bleach precursors, optical brightening agents, fillers, buffers, anti-redeposition agents, preservatives, antifoaming agents, abrasives, thickeners, enzymes, and organic solvents.

Suitable thickeners for the products of the invention include those conventionally used in liquid detergent compositions such as polyethylene oxides, polyethylene glycols, carboxymethyl cellulose,

colloidal silica, Carbopol (Registered Trade Mark) — a carboxyvinyl polymer, Natrosol (Registered Trade Mark) — hydroxyethylcellulose and Veegum (Registered Trade Mark) — a modified montmorillonite clay.

Suitable abrasives for use in the products of the invention include calcite, volcanic ash, felspar, quartz, talc and mixtures thereof.

In use, the surface to be treated is contacted with an aqueous liquor containing the detergent composition of the invention, preferably at such a concentration that the level of the perfume in the liquor is from about 0.005 g per litre to about 0.3 g per litre.

The conditions under which the method of the invention is carried out may vary according to the circumstances, such as whether the surface being treated is a fabric material or a hard surface, the concentration of the aqueous liquor, the degree of perfume deposition desired and the nature of the detergent active material and the nature of the soil to be removed from the surface. However, the treatment of surfaces with the aqueous liquor for a period from 1 to 60 minutes or more and at a temperature of between 20° C and 90° C may be found to be suitable.

Preferably, the treated surface is dried by allowing water to evaporate therefrom at a temperature below 50° C. Thus, in the case of fabrics, it is preferred to line-dry the fabrics. In the case of treating hard surfaces, the surfaces are preferably allowed to dry without application of heat.

The particles may be prepared by a variety of methods. Thus, for example, the cationic component and the perfume component are formed into a liquid mixture such as by melting together, which mixture is subsequently transformed into particles of the desired size.

The liquid mixture may be transformed into particles of the desired size by cooling the mixture to a solid, grinding the solid and sieving the resulting particles. Alternatively, the particles may be formed by dispersing the liquid mixture in a liquid medium such as water and optionally separating the particles from the liquid medium. Alternatively, the liquid mixture may be transformed into particles of the desired size by spray drying.

Best mode of carrying out the invention

The invention will be further described, purely by way of example, in the following non-limiting Examples.

Example 1

19.333 g of Arosurf TA100 (dimethyl stearyl ammoniumchloride) was melted and 0.667 g of a perfume added. An intimate mix was formed by stirring and was then allowed to solidify. The solid was ground in a Moulinex coffee grinder together with dry ice to prevent heat build-up. The particles thus formed were then sieved to give various size fractions, the fraction between 50 µm and 200 µm being selected for use.

2 kg of a mixed synthetic load was washed at 35° C using 90 g of a conventional detergent composition to which had been added 10 g of particles (to give an effective perfume concentration of about 0.3%). A Miele de Luxe 432 front loading automatic washing machine was used with a 10-litre fill of cold Wirral water, giving a liquor : cloth ratio of 9 : 1.

After the wash cycle had ended, fabrics were line-dried overnight and assessed for perfume intensity. Comparison was made with a similar load washed in 100 g of detergent to which 0.3 g of perfume had been added by spraying. The results are shown in Table 1 which quotes the average grading on each type of fabric.

Table I

Mean perfume intensity

Fabric	Test Product	Control Product
Bulked Nylon	0.6	0
Nylon Sheeting	0.4	0
Crimplene	0.7	0
Bulked Acrylic	0.3	0

It was also found that the perfume retention over a period of time was better in the case of the test product than in the case of the control product.

Example 2

17.0 g of Arosurf TA 100 and 2.0 g sorbitan tristearate were melted together and 1.0 g of a perfume added. An intimate mix was formed by stirring and was then allowed to solidify. The solid was ground in a Moulinex coffee grinder together with dry ice to prevent heat build-up. The particles thus formed were then sieved to give various size fractions, the fraction between 50 µm and 200 µm being selected for use.

2 Kg of a mixed synthetic load was washed at 35°C using 96 g of a conventional detergent composition to which had been added 4 g of particles (to give an effective perfume concentration of 0.2%). A Miele de Luxe 432 front loading automatic washing machine was used with an 18-litre fill of cold Wirral water, giving a liquor : cloth ratio of 9 : 1.

After the wash cycle had ended, fabrics were line-dried overnight and assessed for perfume intensity. Comparison was made with a similar load of washing in 100 g of detergent to which 0.2 g of perfume had been added by spraying. The results are shown in Table 2 which quotes the average grading on each type of fabric.

Table II

Mean perfume intensity		
Fabric	Test Product	Control Produkt
Bulked Nylon	0.4	0.1
Crimplene	0.4	0.2
Nylon Sheeting	0.3	0.2
Bulked Acrylic	0.3	0.2

The »conventional detergent composition« used in the above Examples had the following approximate composition:

Ingredient	% by weight
Anionic detergent active material	13
Nonionic detergent active material	7
Sodium tripolyphosphate	35
Sodium silicate	5
Sodium sulphate	26
Water and minor ingredients	balance

Example 3

Particles comprising 95% Arosurf TA 100 and 5% perfume, prepared using the method described in Example 1 can be incorporated in a general purpose hard surface cleaner having the following approximate composition:

Ingredient	% by weight
Alkyl benzene sulphonate (approx C12)	2.0
Coconut fatty acid	1.2
Potassium hydroxide	0.63
Coconut diethanolamide	3.5
Sodium tripolyphosphate	10.0
Particles	20.0
Water	balance

Example 4

Particles comprising 85% Arosurf TA 100, 10% sobiton tristearate and 5% perfume, prepared using the method described in Example 2 can be incorporated in a toilet cleaner having the following approximate composition:

Ingredient	% by weight
Alkyl ether sulphate ($C_{12/15}$3EO)	4.0
Alkyl benzene sulphonate	2.0
Formalin	0.5
Particles	10.0
Water	balance

The words ›Arosurf‹ and ›Miele‹ are Trade Marks.

Claims

1. A detergent composition for cleaning and depositing perfume on a surface, comprising from

5% to 85% by weight of a water-soluble detersive surfactant, with or without a detergency builder; and
from 0.5% to 30% by weight of particles having an average size of from 0.1 to 2000 μm and being an intimate mixture of a matrix material and from 0.5% to 50% by weight of a perfume component, based on the weight of the particles,

characterised in that the matrix material comprises, based on the weight of the particles:

from 22% to 99.5% by weight of a cationic component; and optionally from 0% to 16.6% by weight of a nonionic component, the ratio by weight of the cationic component to the nonionic component, when present, being at least 5 : 1.

2. A material as claimed in Claim 1 wherein the particles contain said nonionic component, characterised in that said nonionic component is a compound or mixture of compounds selected from esters of polyhydric alcohols, fatty alcohols, and derivatives thereof.

3. A material as claimed in any preceding claim wherein the particles contain said nonionic component, characterised in that the ratio by weight of said cationic component to said nonionic component lies between 6 : 1 and 12 : 1.

4. A material as claimed in Claim 1, characterised in that the particles contain substantially no

nonionic material.

5. A material as claimed in any preceding claim, characterised in that the particles further contain a minor amount of amine.

Patentansprüche

1. Reinigungsmittel zum Reinigen und Aufbringen von Parfum auf eine Oberfläche, umfassend

5 bis 85 Gew.-% eines wasserlöslichen, waschreinigenden Tensids mit oder ohne einen Waschmittelbuilder, und
0,5 bis 30 Gew.-% Teilchen mit einer durchschnittlichen Größe von 0,1 bis 2000 µm, die ein inniges Gemisch aus einem Matrixmaterial und 0,5 bis 50 Gew.-% eines Parfumbestandteils, bezogen auf das Gewicht der Teilchen, sind,

dadurch gekennzeichnet, daß das Matrixmaterial, bezogen auf das Gewicht der Teilchen,

22 bis 99,5 Gew.-% eines kationischen Bestandteils und gegebenenfalls 0 bis 16,6 Gew.-% eines nicht-ionischen Bestandteils, wobei das Gewichtsverhältnis des kationischen Bestandteils zum nicht-ionischen Bestandteil, wenn vorhanden, wenigstens 5 : 1 ist,

umfaßt.

2. Material nach Anspruch 1, worin die Teilchen den nicht-ionischen Bestandteil enthalten, dadurch gekennzeichnet, daß der nicht-ionische Bestandteil eine Verbindung oder ein Gemisch von Verbindungen, ausgewählt unter Estern mehrwertiger Alkohole, Fettalkohole und Derivaten hiervon, ist.

3. Material nach irgendeinem vorhergehenden Anspruch, worin die Teilchen den nicht-ionischen Bestandteil enthalten, dadurch gekennzeichnet, daß das Gewichtsverhältnis von dem kationischen Bestandteil zu dem nicht-ionischen Bestandteil zwischen 6 : 1 und 12 : 1 liegt.

4. Material nach Anspruch 1, dadurch gekennzeichnet, daß die Teilchen praktisch kein nicht-ionisches Material enthalten.

5. Material nach irgendeinem vorhergehenden Anspruch, dadurch gekennzeichnet, daß die Teilchen ferner eine geringe Menge Amin enthalten.

Revendications

1. Une composition détergente pour le nettoyage d'une surface et le dépôt d'un parfum sur elle, comprenant de 5% à 85% en poids d'un agent tensio-actif détergent soluble dans l'eau, avec ou sans un adjuvant de détergence; et de 0,5% à 30% en poids de particules ayant une grosseur moyenne comprise entre 0,1 et 2000 µm et qui sont un mélange intime d'une matière formant matrice et de 0,5% à 50% en poids d'un constituant odoriférant, par rapport au poids des particules, caractérisée en ce que la matière formant matrice comprend, par rapport au poids des particules, de 22% à 99,5% en poids d'un constituant cationique; et éventuellement de 0% à 16,6% en poids d'un constituant non-ionique, le rapport en poids du constituant cationique au constituant non-ionique, quand il est présent, étant d'au moins 5 : 1.

2. Une matière selon la revendication 1, dans laquelle les particules contiennent le constituant non-ionique, caractérisée en ce que le constituant non-ionique est un composé ou un mélange de composés choisis parmi des esters d'alcools polyhydriques, des alcools gras et leurs dérivés.

3. Une matière selon l'une quelconque des revendications précédentes, dans laquelle les particules contiennent le constituant non-ionique, caractérisée en ce que le rapport au poids du constituant cationique au constituant non-ionique est compris entre 6 : 1 et 12 : 1.

4. Une matière selon la revendication 1, caractérisée en ce que les particules ne contiennent sensiblement pas de matière non-ionique.

5. Une matière selon l'une quelconque des revendications précédentes, caractérisée en ce que les particules contiennent aussi une quantité mineure d'amine.